

**Advanced Passive 1000 (AP1000)  
Generic Technical Specification Traveler (GTST)**

---

**Title: Changes Related to LCO 3.4.6, Pressurizer Safety Valves**

---

**I. Technical Specifications Task Force (TSTF) Travelers, Approved Since Revision 2 of STS NUREG-1431, and Used to Develop this GTST**

**TSTF Number and Title:**

TSTF-479-A, Rev 0, Changes to Reflect Revision of 10 CFR 50.55a

**STS NUREGs Affected:**

TSTF-479-A, Rev 0: NUREGs 1430, 1431, 1432, 1433, and 1434

**NRC Approval Date:**

TSTF-479-A, Rev 0: 06-Dec-05

**TSTF Classification:**

TSTF-479-A, Rev 0: Technical Change

---

**II. Reference Combined License (RCOL) Standard Departures (Std. Dep.), RCOL COL Items, and RCOL Plant-Specific Technical Specifications (PTS) Changes Used to Develop this GTST**

**RCOL Std. Dep. Number and Title:**

There are no Vogtle departures applicable to Specification 3.4.6.

**RCOL COL Item Number and Title:**

There are no Vogtle COL items applicable to Specification 3.4.6.

**RCOL PTS Change Number and Title:**

VEGP LAR DOC A003: References to various Chapters and Sections of the Final Safety Analysis Report (FSAR) are revised to include FSAR.  
VEGP LAR DOC A044: Mode 4 Applicability is editorially revised  
VEGP LAR DOC A052: Editorial change of Condition statement  
VEGP LAR DOC M07: "Pressurizer Safety Valves," Applicability Note revision

---

**III. Comments on Relations Among TSTFs, RCOL Std. Dep., RCOL COL Items, and RCOL PTS Changes**

This section discusses the considered changes that are: (1) applicable to operating reactor designs, but not to the AP1000 design; (2) already incorporated in the GTS; or (3) superseded by another change.

TSTF-479-A has been applied to AP1000 GTS 3.4.6, Rev 19 by Westinghouse. TSTF-479-A will not be discussed further as a part of this GTST.

---

**IV. Additional Changes Proposed as Part of this GTST (modifications proposed by NRC staff and/or clear editorial changes or deviations identified by preparer of GTST)**

APOG Recommended Changes to Improve the Bases

Throughout the Bases, references to Sections and Chapters of the FSAR do not include the "FSAR" clarifier. Since these Section and Chapter references are to an external document, it is appropriate to include the "FSAR" modifier. (DOC A003)

---

## **V. Applicability**

### **Affected Generic Technical Specifications and Bases:**

Subsection 3.4.6, Pressurizer Safety Valves

### **Changes to the Generic Technical Specifications and Bases:**

LCO 3.4.6 Applicability statement is revised to split MODE 4 statement into two parts and the corresponding Bases are updated. This is consistent with TS Writer's Guide (Reference 4). (DOC A044)

LCO 3.4.6 Applicability Note is revised to allow for hot lift setting adjustment and the corresponding Bases are updated. This provides assurance that during MODES 3 and 4, at least one pressurizer safety valve that has had a preliminary cold setting is available to provide overpressure protection. (DOC M07)

Clarification is added to Condition B statement. This is consistent with TS Writer's Guide (Reference 4). (DOC A052)

The acronym "FSAR" is added to modify "Section" and "Chapter" in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

---

## **VI. Traveler Information**

### **Description of TSTF changes:**

Not applicable

### **Rationale for TSTF changes:**

Not applicable

### **Description of changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:**

VEGP LAR DOC A044 revises the Mode 4 Applicability editorially into two Applicabilities.

VEGP LAR DOC A052 revises the Condition B first entry condition by addition of “of Condition A.”

VEGP LAR DOC M07 revises the Applicability Note to include a requirement that “One pressurizer safety valve at a time may be inoperable for hot lift setting adjustment.”

A more detailed description of each DOC can be found in Reference 2, VEGP TSU LAR Enclosure 1, and the NRC staff safety evaluation can be found in Reference 3, VEGP LAR SER. The VEGP TSU LAR was modified in response to NRC staff RAIs in Reference 5 and the Southern Nuclear Operating Company RAI Response in Reference 6.

### **Rationale for changes in RCOL Std. Dep., RCOL COL Item(s), and RCOL PTS Changes:**

Applicability editorial change and Condition B entry statement change per VEGP LAR DOC A044 and DOC A052 are consistent with the TS Writer's Guide (Reference 4).

VEGP LAR DOC M07 revision of the Applicability Note permits testing and examination of the safety valves at high pressure and temperature near their normal operating range, but only after the valves have had a preliminary cold setting.

### **Description of additional changes proposed by NRC staff/preparer of GTST:**

The acronym “FSAR” is added to modify “Section” and “Chapter” in references to the FSAR throughout the Bases. (DOC A003) (APOG Comment)

### **Rationale for additional changes proposed by NRC staff/preparer of GTST:**

Since Bases references to FSAR Sections and Chapters are to an external document, it is appropriate to include the “FSAR” modifier.

---

**VII. GTST Safety Evaluation****Technical Analysis:**

VEGP LAR DOC M07 revises the LCO Applicability Note. The GTS Applicability Note states “The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions.” The Note allows entry into MODES 3 and 4 with the lift setpoints outside the LCO limits. This permits testing and examination of the safety valves at high pressure and temperature near their normal operating range, but only after the valves have had a preliminary cold setting. The cold setting gives assurance that the valves are OPERABLE near their design condition. However, the associated Bases go further, stating that “Only one valve at a time will be removed from service for testing.” This prohibition, limiting how lift settings and testing are performed, is not stated in the Applicability Note. The proposed Note provides assurance that during MODES 3 and 4, at least one pressurizer safety valve that has had a preliminary cold setting is available to provide overpressure protection.

The remaining changes are editorial, clarifying, grammatical, or otherwise considered administrative. These changes do not affect the technical content, but improve the readability, implementation, and understanding of the requirements, and are therefore acceptable.

Having found that this GTST’s proposed changes to the GTS and Bases are acceptable, the NRC staff concludes that AP1000 STS Subsection 3.4.6 is an acceptable model Specification for the AP1000 standard reactor design.

**References to Previous NRC Safety Evaluation Reports (SERs):**

None

---

**VIII. Review Information****Evaluator Comments:**

None

Randy Belles  
Oak Ridge National Laboratory  
865-574-0388  
bellesrj@ornl.gov

**Review Information:**

Availability for public review and comment on Revision 0 of this traveler approved by NRC staff on 5/16/2014.

**APOG Comments (Ref. 7) and Resolutions:**

1. (Internal # 3) Throughout the Bases, references to Sections and Chapters of the FSAR do not include the "FSAR" clarifier. Since these Section and Chapter references are to an external document, it is appropriate (DOC A003) to include the "FSAR" modifier. This is resolved by adding the FSAR modifier as appropriate.
2. (Internal # 6) The GTST sections often repeat VEGP LAR DOCs, which reference "existing" and "current" requirements. The inclusion in the GTST of references to "existing" and "current," are not always valid in the context of the GTS. Each occurrence of "existing" and "current" should be revised to be clear and specific to GTS, MTS, or VEGP COL TS (or other), as appropriate. Noted ambiguities are corrected in the GTST body.
3. (Internal # 7) Section VII, GTST Safety Evaluation, inconsistently completes the subsection "References to Previous NRC Safety Evaluation Reports (SERs)" by citing the associated SE for VEGP 3&4 COL Amendment 13. It is not clear whether there is a substantive intended difference when omitting the SE citation. This is resolved by removing the SE citation in Section VII of the GTST and ensuring that appropriate references to the consistent citation of this reference in Section X of the GTST are made.
4. (Internal # 241) APOG notes that GTS LCO 3.4.6 has an Applicability Note that is mistakenly entered in the GTST as an LCO Note. The GTS evaluation and the corresponding Bases, continue to reflect the existence of Applicability Notes. The Note should be moved from after the LCO statement to after the Applicability statements. This is resolved by moving the Note.

**NRC Final Approval Date:** 5/27/2015

---



**NRC Contact:**

Hien Le  
United States Nuclear Regulatory Commission  
301-415-1511  
Hien.Le@nrc.gov

---

**IX. Evaluator Comments for Consideration in Finalizing Technical Specifications and Bases**

None

---

**X. References Used in GTST**

1. AP1000 DCD, Revision 19, Section 16, "Technical Specifications," June 2011 (ML11171A500).
2. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Technical Specifications Upgrade License Amendment Request, February 24, 2011 (ML12065A057).
3. NRC Safety Evaluation (SE) for Amendment No. 13 to Combined License (COL) No. NPF-91 for Vogtle Electric Generating Plant (VEGP) Unit 3, and Amendment No. 13 to COL No. NPF-92 for VEGP Unit 4, September 9, 2013, ADAMS Package Accession No. ML13238A337, which contains:
  - ML13238A355 Cover Letter - Issuance of License Amendment No. 13 for Vogtle Units 3 and 4 (LAR 12-002).
  - ML13238A359 Enclosure 1 - Amendment No. 13 to COL No. NPF-91
  - ML13239A256 Enclosure 2 - Amendment No. 13 to COL No. NPF-92
  - ML13239A284 Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13)
  - ML13239A287 Enclosure 4 - Safety Evaluation (SE), and Attachment 1 - Acronyms
  - ML13239A288 SE Attachment 2 - Table A - Administrative Changes
  - ML13239A319 SE Attachment 3 - Table M - More Restrictive Changes
  - ML13239A333 SE Attachment 4 - Table R - Relocated Specifications
  - ML13239A331 SE Attachment 5 - Table D - Detail Removed Changes
  - ML13239A316 SE Attachment 6 - Table L - Less Restrictive Changes

The following documents were subsequently issued to correct an administrative error in Enclosure 3:

  - ML13277A616 Letter - Correction To The Attachment (Replacement Pages) - Vogtle Electric Generating Plant Units 3 and 4-Issuance of Amendment Re: Technical Specifications Upgrade (LAR 12-002) (TAC No. RP9402)
  - ML13277A637 Enclosure 3 - Revised plant-specific TS pages (Attachment to Amendment No. 13) (corrected)
4. TSTF-GG-05-01, "Writer's Guide for Plant-Specific Improved Technical Specifications," June 2005.
5. RAI Letter No. 01 Related to License Amendment Request (LAR) 12-002 for the Vogtle Electric Generating Plant Units 3 and 4 Combined Licenses, September 7, 2012 (ML12251A355).
6. Southern Nuclear Operating Company, Vogtle Electric Generating Plant, Units 3 and 4, Response to Request for Additional Information Letter No. 01 Related to License Amendment Request LAR-12-002, ND-12-2015, October 04, 2012 (ML12286A363 and ML12286A360)

7. APOG-2014-008, APOG (AP1000 Utilities) Comments on AP1000 Standardized Technical Specifications (STS) Generic Technical Specification Travelers (GTSTs), Docket ID NRC-2014-0147, September 22, 2014 (ML14265A493).
-

**XI. MARKUP of the Applicable GTS Subsection for Preparation of the STS NUREG**

The entire section of the Specifications and the Bases associated with this GTST is presented next.

Changes to the Specifications and Bases are denoted as follows: Deleted portions are marked in strikethrough red font, and inserted portions in bold blue font.

3.4 REACTOR COOLANT SYSTEM (RCS)

3.4.6 Pressurizer Safety Valves

LCO 3.4.6 Two pressurizer safety valves shall be OPERABLE with lift settings  $\geq 2460$  psig and  $\leq 2510$  psig.

APPLICABILITY: MODES 1, 2, and 3,  
MODE 4 with Normal Residual Heat Removal System (RNS) isolated ~~or~~,  
**MODE 4 with** RCS temperature  $\geq 275^\circ\text{F}$ .

-----NOTE-----  
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. **One pressurizer safety valve at a time may be inoperable for hot lift setting adjustment.**

This exception is allowed for 36 hours following entry into MODE 3, provided a preliminary cold setting was made prior to heatup.  
-----

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time <b>of Condition A</b> not met.  <u>OR</u> Two pressurizer safety valves inoperable.	B.1 Be in MODE 3.  <u>AND</u> B.2 Be in MODE 4 with RNS aligned to the RCS and RCS temperature $< 275^\circ\text{F}$ .	6 hours  24 hours

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.6.1      Verify each pressurizer safety valve OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within $\pm 1\%$ .	In accordance with the Inservice Testing Program

## B 3.4 REACTOR COOLANT SYSTEM (RCS)

## B 3.4.6 Pressurizer Safety Valves

BASES

---

**BACKGROUND** The two pressurizer safety valves provide, in conjunction with the Protection and Safety Monitoring System (PMS), overpressure protection for the RCS. The pressurizer safety valves are totally enclosed, spring loaded, self-actuated valves with backpressure compensation. The safety valves are designed to prevent the system pressure from exceeding the system Safety Limit (SL), 2733.5 psig, which is 110% of the design pressure.

Because the safety valves are totally enclosed and self actuating, they are considered independent components. The minimum relief capacity for each valve, 750,000 lb/hr, is based on postulated overpressure transient conditions resulting from a complete loss of steam flow to the turbine. This event results in the maximum surge rate into the pressurizer, which specifies the minimum relief capacity for the safety valves. The pressurizer safety valves discharge into the containment atmosphere. This discharge flow is indicated by an increase in temperature downstream of the pressurizer safety valves.

Overpressure protection is required in MODES 1, 2, 3, 4, 5, and 6 when the reactor vessel head is on; however, in MODE 4 with the RNS aligned, MODE 5, and MODE 6 with the reactor vessel head on, overpressure protection is provided by operating procedures and by meeting the requirements of LCO 3.4.14, "Low Temperature Overpressure Protection (LTOP)-~~System~~."

The upper and lower pressure limits are based on the  $\pm 1\%$  tolerance requirement (Ref. 1) for lifting pressures above 1000 psig. The lift setting is for the ambient conditions associated with MODES 1, 2, and 3. This requires either that the valves be set hot or that a correlation between hot and cold settings be established.

The pressurizer safety valves are part of the primary success path and mitigate the effects of postulated accidents. OPERABILITY of the safety valves ensures that the RCS pressure will be limited to 110% of design pressure.



**BASES**

---

**BACKGROUND (continued)**

The consequences of exceeding the ASME Code, Section III pressure limit (Ref. 1) could include damage to RCS components, increased LEAKAGE, or a requirement to perform additional stress analyses prior to resumption of reactor operation.

---

**APPLICABLE SAFETY ANALYSES**

All accident and safety analyses in **FSAR** Chapter 15 (Ref. 3) that require safety valve actuation assume operation of two pressurizer safety valves to limit increases in the RCS pressure. The overpressure protection analysis (Ref. 2) is also based on operation of the two safety valves. Accidents that could result in overpressurization if not properly terminated include:

- a. Uncontrolled rod withdrawal from full power;
- b. Loss of reactor coolant flow;
- c. Loss of external electrical load;
- d. Locked rotor; and
- e. Loss of AC power/loss of normal feedwater

Detailed analyses of the above transients are contained in Reference 3. Compliance with this LCO is consistent with the design bases and accident analyses assumptions.

Pressurizer Safety Valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

---

**LCO**

The two pressurizer safety valves are set to open at the RCS design pressure (2500 psia), and within the ASME specified tolerance, to avoid exceeding the maximum design pressure SL, to maintain accident analyses assumptions, and to comply with ASME requirements. The upper and lower pressure tolerance limits are based on the  $\pm 1\%$  tolerance requirements (Ref. 1) for lifting pressures above 1000 psig.

The limit protected by this specification is the Reactor Coolant Pressure Boundary (RCPB) SL of 110% of design pressure. Inoperability of one or more valves could result in exceeding the SL if a transient were to occur. The consequences of exceeding the ASME pressure limit could include damage to one or more RCS components, increased leakage, or

---

**BASES**

---

**LCO (continued)**

additional stress analysis being required prior to resumption of reactor operation.

---

**APPLICABILITY**

In MODES 1, 2, and 3, ~~and~~ portions of MODE 4 with the Normal Residual Heat Removal System (RNS) isolated ~~or~~ **and portions of MODE 4** with the RCS temperature  $\geq 275^{\circ}\text{F}$ , OPERABILITY of two valves is required because the combined capacity is required to keep reactor coolant pressure below 110% of its design value during certain accidents. MODE 3 and portions of MODE 4 are conservatively included although the listed accidents may not require the safety valves for protection.

The LCO is not applicable in MODE 4 with RNS ~~open~~ **not isolated, in MODE 4 with RCS temperature  $\leq 275^{\circ}\text{F}$** , and in MODE 5, because LTOP is provided. Overpressure protection is not required in MODE 6 with reactor vessel head detensioned.

The Note allows entry into MODES 3 and 4 with the lift setpoints outside the LCO limits. This permits testing and examination of the safety valves at high pressure and temperature near their normal operating range, but only after the valves have had a preliminary cold setting. The cold setting gives assurance that the valves are OPERABLE near their design condition. **Only one valve at a time may be made inoperable for hot lift setting adjustment.** ~~Only one valve at a time will be removed from service for testing.~~ The 36 hour exception is based on 18 hour outage time for each of the two valves. The 18 hour period is derived from operating experience that hot testing can be performed in this time frame.

---

**ACTIONS****A.1**

With one pressurizer safety valve inoperable, restoration must take place within 15 minutes. The Completion Time of 15 minutes reflects the importance of maintaining the RCS Overpressure Protection System. An inoperable safety valve coincident with an RCS overpressure event could challenge the integrity of the pressure boundary.

---

**BASES**

---

**ACTIONS (continued)**B.1 and B.2

If the Required Action of A.1 cannot be met within the required Completion Time or if two pressurizer safety valves are inoperable, the plant must be placed in a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 with the RNS aligned to the RCS and RCS temperature < 275°F within 24 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. With the RNS aligned to the RCS, overpressure protection is provided by the LTOP System. The change from MODE 1, 2, or 3 to MODE 4 reduces the RCS energy (core power and pressure), lowers the potential for large pressurizer insurges, and thereby removes the need for overpressure protection by two pressurizer safety valves.

---

**SURVEILLANCE  
REQUIREMENTS**SR 3.4.6.1

SRs are specified in the Inservice Testing Program. Pressurizer safety valves are to be tested one at a time and in accordance with the requirements of ASME OM Code (Ref. 4), which provides the activities and Frequency necessary to satisfy the SRs. No additional requirements are specified.

The pressurizer safety valve setpoint is  $\pm 1\%$  for OPERABILITY, and the values are reset to remain within  $\pm 1\%$  during the Surveillance to allow for drift.

---

**REFERENCES**

1. ASME Boiler and Pressure Vessel Code, Section III, NB 7500.
  2. WCAP-16779, "AP1000 Overpressure Protection Report, April 2007."
  3. **FSAR** Chapter 15, "Accident Analyses."
  4. ASME OM Code, "Code for Operation and Maintenance of Nuclear Power Plants."
-

**XII. Applicable STS Subsection After Incorporation of this GTST's Modifications**

The entire subsection of the Specifications and the Bases associated with this GTST, following incorporation of the modifications, is presented next.

## 3.4 REACTOR COOLANT SYSTEM (RCS)

## 3.4.6 Pressurizer Safety Valves

LCO 3.4.6 Two pressurizer safety valves shall be OPERABLE with lift settings  $\geq 2460$  psig and  $\leq 2510$  psig.

APPLICABILITY: MODES 1, 2, and 3,  
MODE 4 with Normal Residual Heat Removal System (RNS) isolated,  
MODE 4 with RCS temperature  $\geq 275^\circ\text{F}$ .

-----NOTE-----  
The lift settings are not required to be within the LCO limits during MODES 3 and 4 for the purpose of setting the pressurizer safety valves under ambient (hot) conditions. One pressurizer safety valve at a time may be inoperable for hot lift setting adjustment.

This exception is allowed for 36 hours following entry into MODE 3, provided a preliminary cold setting was made prior to heatup.  
-----

## ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One pressurizer safety valve inoperable.	A.1 Restore valve to OPERABLE status.	15 minutes
B. Required Action and associated Completion Time of Condition A not met.  <u>OR</u> Two pressurizer safety valves inoperable.	B.1 Be in MODE 3.  <u>AND</u> B.2 Be in MODE 4 with RNS aligned to the RCS and RCS temperature $< 275^\circ\text{F}$ .	6 hours  24 hours

## SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.6.1      Verify each pressurizer safety valve OPERABLE in accordance with the Inservice Testing Program. Following testing, lift settings shall be within $\pm 1\%$ .	In accordance with the Inservice Testing Program

## B 3.4 REACTOR COOLANT SYSTEM (RCS)

## B 3.4.6 Pressurizer Safety Valves

**BASES**

---

**BACKGROUND** The two pressurizer safety valves provide, in conjunction with the Protection and Safety Monitoring System (PMS), overpressure protection for the RCS. The pressurizer safety valves are totally enclosed, spring loaded, self-actuated valves with backpressure compensation. The safety valves are designed to prevent the system pressure from exceeding the system Safety Limit (SL), 2733.5 psig, which is 110% of the design pressure.

Because the safety valves are totally enclosed and self actuating, they are considered independent components. The minimum relief capacity for each valve, 750,000 lb/hr, is based on postulated overpressure transient conditions resulting from a complete loss of steam flow to the turbine. This event results in the maximum surge rate into the pressurizer, which specifies the minimum relief capacity for the safety valves. The pressurizer safety valves discharge into the containment atmosphere. This discharge flow is indicated by an increase in temperature downstream of the pressurizer safety valves.

Overpressure protection is required in MODES 1, 2, 3, 4, 5, and 6 when the reactor vessel head is on; however, in MODE 4 with the RNS aligned, MODE 5, and MODE 6 with the reactor vessel head on, overpressure protection is provided by operating procedures and by meeting the requirements of LCO 3.4.14, "Low Temperature Overpressure Protection (LTOP)."

The upper and lower pressure limits are based on the  $\pm 1\%$  tolerance requirement (Ref. 1) for lifting pressures above 1000 psig. The lift setting is for the ambient conditions associated with MODES 1, 2, and 3. This requires either that the valves be set hot or that a correlation between hot and cold settings be established.

The pressurizer safety valves are part of the primary success path and mitigate the effects of postulated accidents. OPERABILITY of the safety valves ensures that the RCS pressure will be limited to 110% of design pressure.

**BASES**

---

**BACKGROUND (continued)**

The consequences of exceeding the ASME Code, Section III pressure limit (Ref. 1) could include damage to RCS components, increased LEAKAGE, or a requirement to perform additional stress analyses prior to resumption of reactor operation.

---

**APPLICABLE SAFETY ANALYSES**

All accident and safety analyses in FSAR Chapter 15 (Ref. 3) that require safety valve actuation assume operation of two pressurizer safety valves to limit increases in the RCS pressure. The overpressure protection analysis (Ref. 2) is also based on operation of the two safety valves. Accidents that could result in overpressurization if not properly terminated include:

- a. Uncontrolled rod withdrawal from full power;
- b. Loss of reactor coolant flow;
- c. Loss of external electrical load;
- d. Locked rotor; and
- e. Loss of AC power/loss of normal feedwater

Detailed analyses of the above transients are contained in Reference 3. Compliance with this LCO is consistent with the design bases and accident analyses assumptions.

Pressurizer Safety Valves satisfy Criterion 3 of 10 CFR 50.36(c)(2)(ii).

---

**LCO**

The two pressurizer safety valves are set to open at the RCS design pressure (2500 psia), and within the ASME specified tolerance, to avoid exceeding the maximum design pressure SL, to maintain accident analyses assumptions, and to comply with ASME requirements. The upper and lower pressure tolerance limits are based on the  $\pm 1\%$  tolerance requirements (Ref. 1) for lifting pressures above 1000 psig.

The limit protected by this specification is the Reactor Coolant Pressure Boundary (RCPB) SL of 110% of design pressure. Inoperability of one or more valves could result in exceeding the SL if a transient were to occur. The consequences of exceeding the ASME pressure limit could include damage to one or more RCS components, increased leakage, or



**BASES**

---

**LCO (continued)**

additional stress analysis being required prior to resumption of reactor operation.

---

**APPLICABILITY**

In MODES 1, 2, and 3, portions of MODE 4 with the Normal Residual Heat Removal System (RNS) isolated and portions of MODE 4 with the RCS temperature  $\geq 275^{\circ}\text{F}$ , OPERABILITY of two valves is required because the combined capacity is required to keep reactor coolant pressure below 110% of its design value during certain accidents. MODE 3 and portions of MODE 4 are conservatively included although the listed accidents may not require the safety valves for protection.

The LCO is not applicable in MODE 4 with RNS not isolated, in MODE 4 with RCS temperature  $\leq 275^{\circ}\text{F}$ , and in MODE 5, because LTOP is provided. Overpressure protection is not required in MODE 6 with reactor vessel head detensioned.

The Note allows entry into MODES 3 and 4 with the lift setpoints outside the LCO limits. This permits testing and examination of the safety valves at high pressure and temperature near their normal operating range, but only after the valves have had a preliminary cold setting. The cold setting gives assurance that the valves are OPERABLE near their design condition. Only one valve at a time may be made inoperable for hot lift setting adjustment. The 36 hour exception is based on 18 hour outage time for each of the two valves. The 18 hour period is derived from operating experience that hot testing can be performed in this time frame.

---

**ACTIONS**A.1

With one pressurizer safety valve inoperable, restoration must take place within 15 minutes. The Completion Time of 15 minutes reflects the importance of maintaining the RCS Overpressure Protection System. An inoperable safety valve coincident with an RCS overpressure event could challenge the integrity of the pressure boundary.

---

BASES

---

## ACTIONS (continued)

B.1 and B.2

If the Required Action of A.1 cannot be met within the required Completion Time or if two pressurizer safety valves are inoperable, the plant must be placed in a MODE in which the requirement does not apply. To achieve this status, the plant must be brought to at least MODE 3 within 6 hours and to MODE 4 with the RNS aligned to the RCS and RCS temperature < 275°F within 24 hours.

The allowed Completion Times are reasonable, based on operating experience, to reach the required plant conditions from full power conditions in an orderly manner and without challenging plant systems. With the RNS aligned to the RCS, overpressure protection is provided by the LTOP System. The change from MODE 1, 2, or 3 to MODE 4 reduces the RCS energy (core power and pressure), lowers the potential for large pressurizer insurges, and thereby removes the need for overpressure protection by two pressurizer safety valves.

---

SURVEILLANCE  
REQUIREMENTSSR 3.4.6.1

SRs are specified in the Inservice Testing Program. Pressurizer safety valves are to be tested one at a time and in accordance with the requirements of ASME OM Code (Ref. 4), which provides the activities and Frequency necessary to satisfy the SRs. No additional requirements are specified.

The pressurizer safety valve setpoint is  $\pm 1\%$  for OPERABILITY, and the values are reset to remain within  $\pm 1\%$  during the Surveillance to allow for drift.

---

REFERENCES

1. ASME Boiler and Pressure Vessel Code, Section III, NB 7500.
  2. WCAP-16779, "AP1000 Overpressure Protection Report, April 2007."
  3. FSAR Chapter 15, "Accident Analyses."
  4. ASME OM Code, "Code for Operation and Maintenance of Nuclear Power Plants."
-